

COMPACT DISC PLAYER

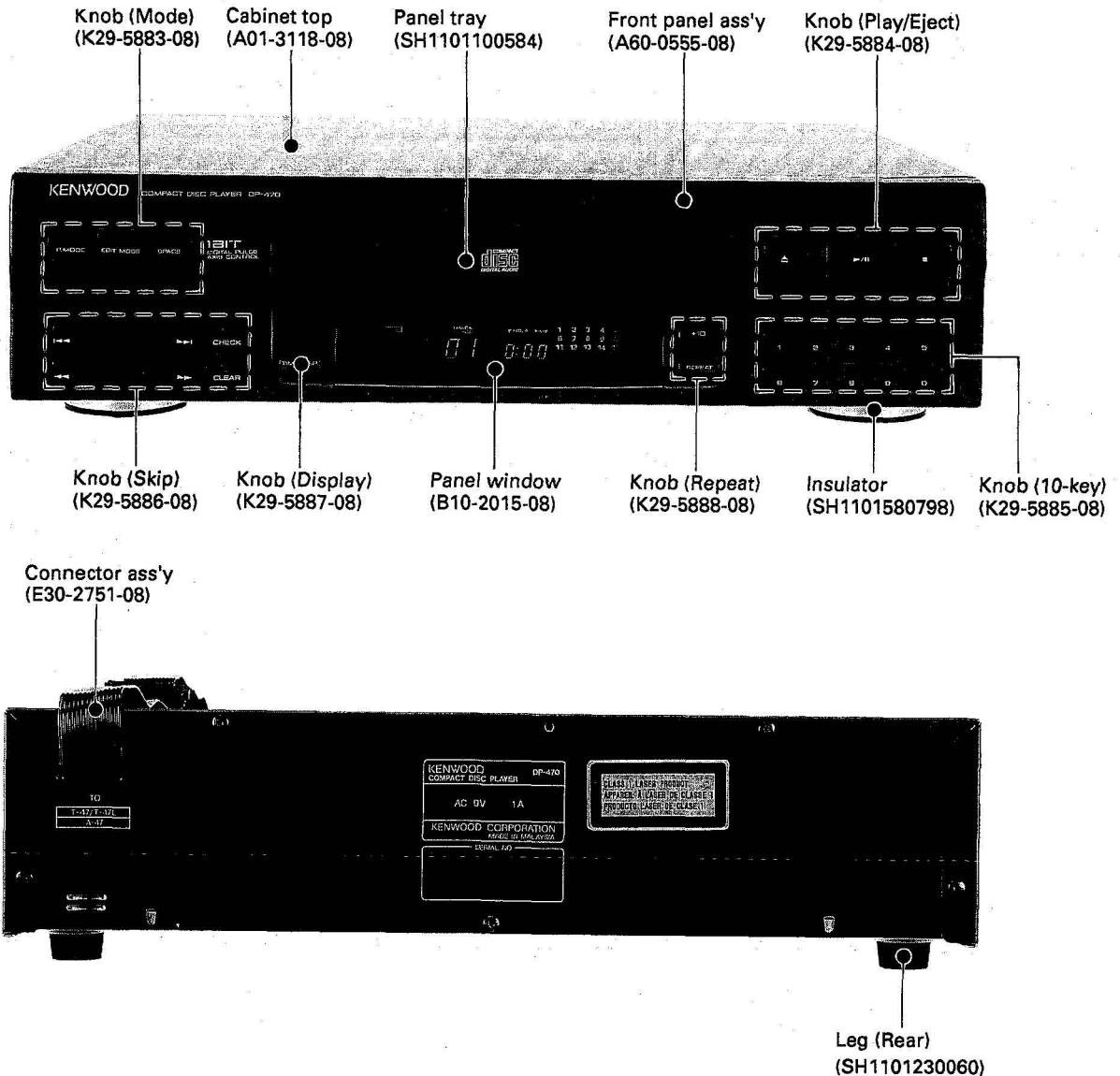
# DP-470

## SERVICE MANUAL

(System K-66, MIDI M-47)

# KENWOOD

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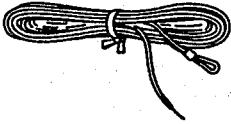
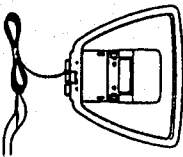

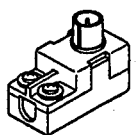

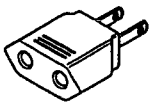
# DP-470

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### CONTENTS

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### ACCESSORIES

|   |   |  |
|---|---|--|
| <ul style="list-style-type: none"> <li>• FM indoor antenna ..... 1<br/>(SH1105020014)</li> </ul>   | <ul style="list-style-type: none"> <li>• Loop antenna ..... 1<br/>(SH1105020020)</li> </ul>  | <ul style="list-style-type: none"> <li>• Remote control unit ..... 1<br/>(W03-4603-08)</li> </ul>               |
| <ul style="list-style-type: none"> <li>• Antenna adaptor (75<math>\Omega</math>/300<math>\Omega</math>) ..... 1<br/>(SH1105240051)</li> </ul>  | <ul style="list-style-type: none"> <li>• Batteries (R6/AA) ..... 2<br/>(-)</li> </ul>      | <ul style="list-style-type: none"> <li>• AC plug adaptor (M type only) ..... 1<br/>(SH1305240053)</li> </ul>  |

(Except for some areas)  
For the unit with a European AC plug in areas other than Europe.

All accessories are packed with X-47.

#### M, X type

| System name | Tuner | Amp  | Cassette deck | CD player | Speaker |
|-------------|-------|------|---------------|-----------|---------|
| K-66        | T-47  | A-47 | X-47          | DP-470    | LS-47   |

#### T, E type

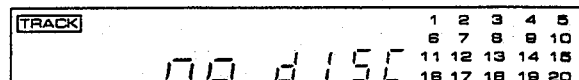
| System name | Tuner | Amp  | Cassette deck | CD player | Speaker |
|-------------|-------|------|---------------|-----------|---------|
| MIDI M-47   | T-47L | A-47 | X-47          | DP-470    | LS-47   |

|        |                   |
|--------|-------------------|
| Option | Graphic equalizer |
|        | GE-470            |

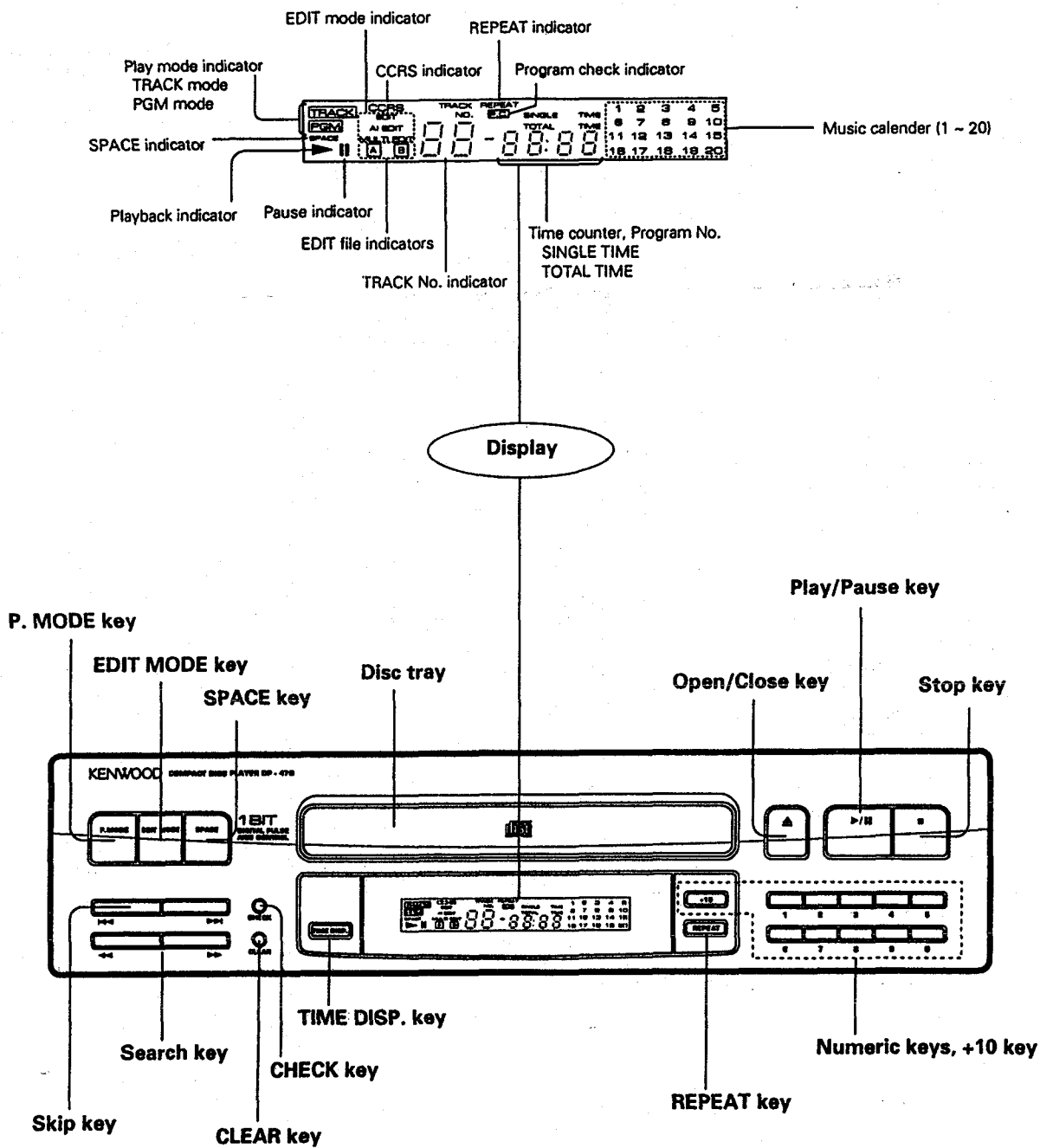
#### Note related to transportation and movement

Before transporting or moving the CD PLAYER, carry out the following operations.

1. Turn the power ON but do not load a disc.
2. Wait a few seconds and verify that the display shown appears.
3. Turn the power OFF.

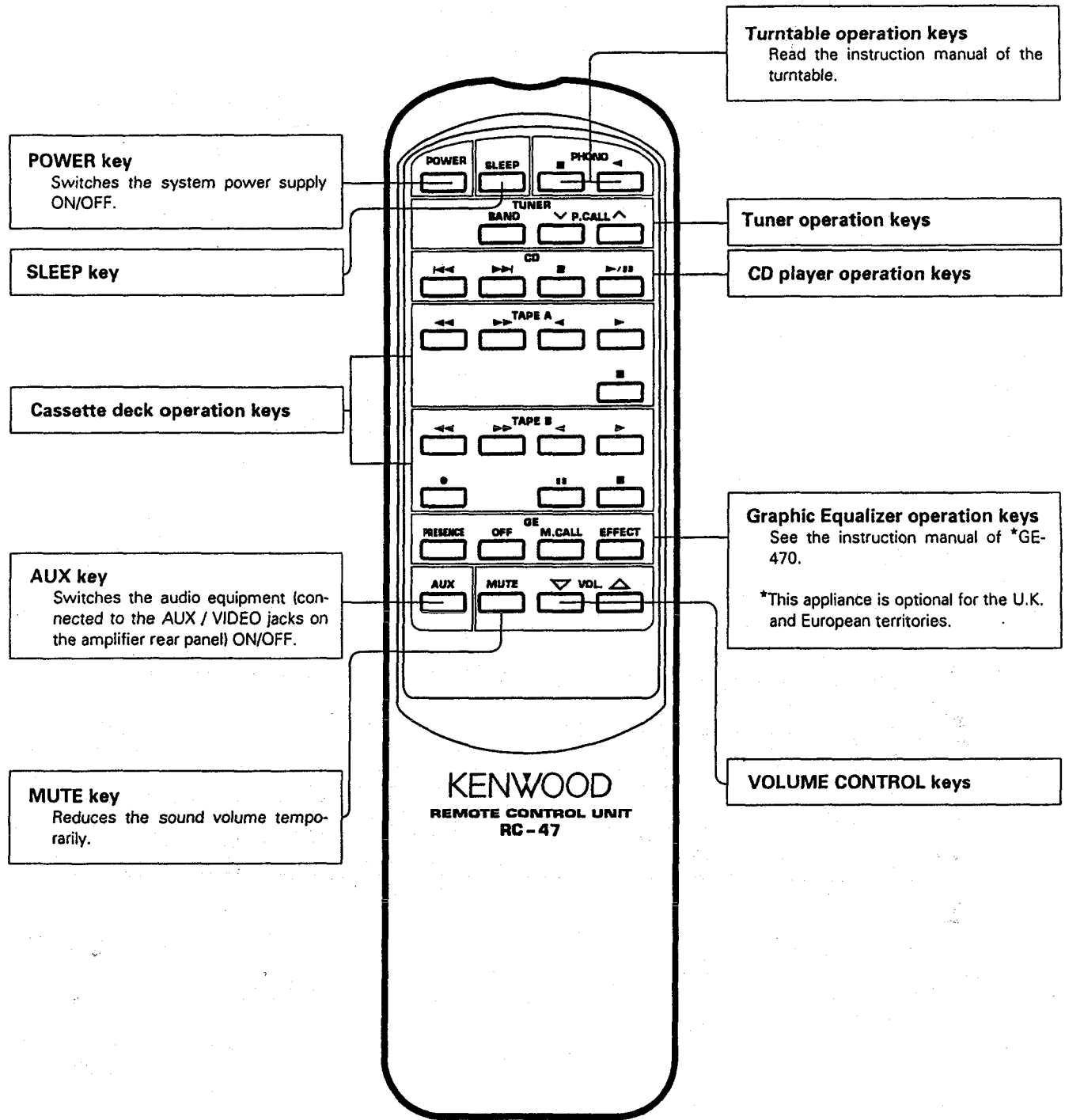


## CONTROL



# DP-470

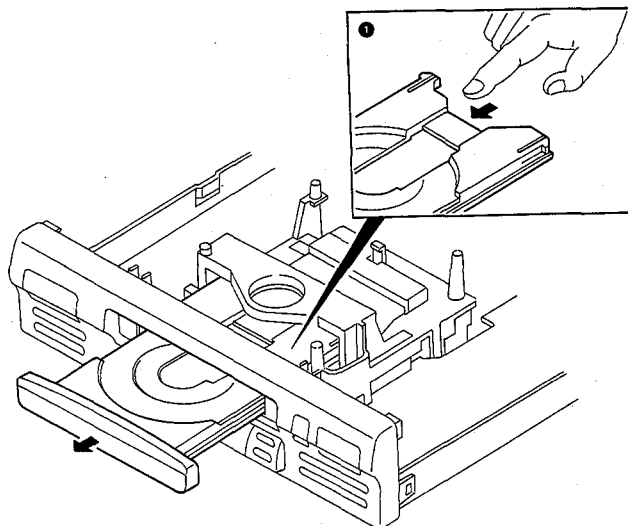
## REMOTE CONTROL



## DISASSEMBLY FOR REPAIR

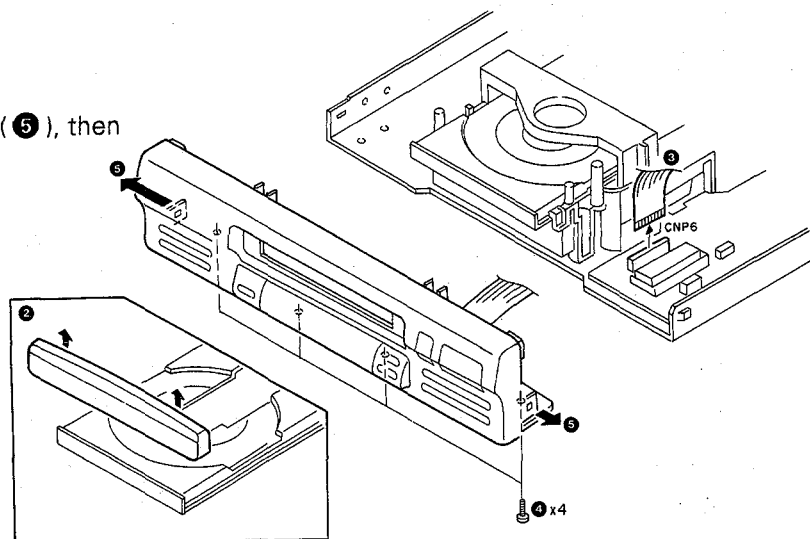
### 1. When not coming out the tray under normal operation

1. Press the tray slowly by hand (1).



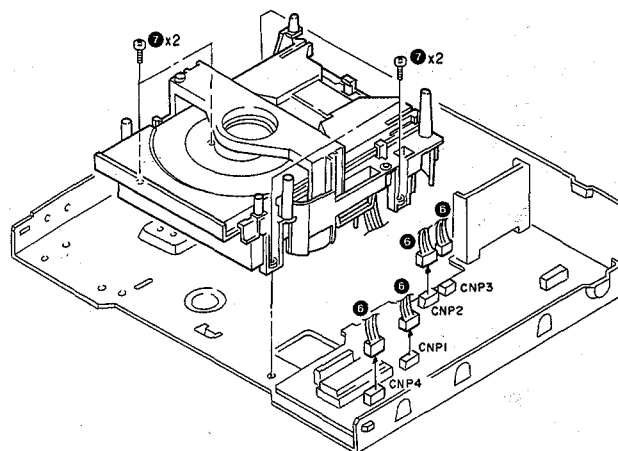
### 2. Removing the front panel

1. Remove the tray panel (2).
2. Disconnect the flexible cord (3).
3. Remove the 4 screws (4).
4. Remove the panel-catches from chassis (5), then remove the front panel.



### 3. Removing the mechanism ass'y and that tray

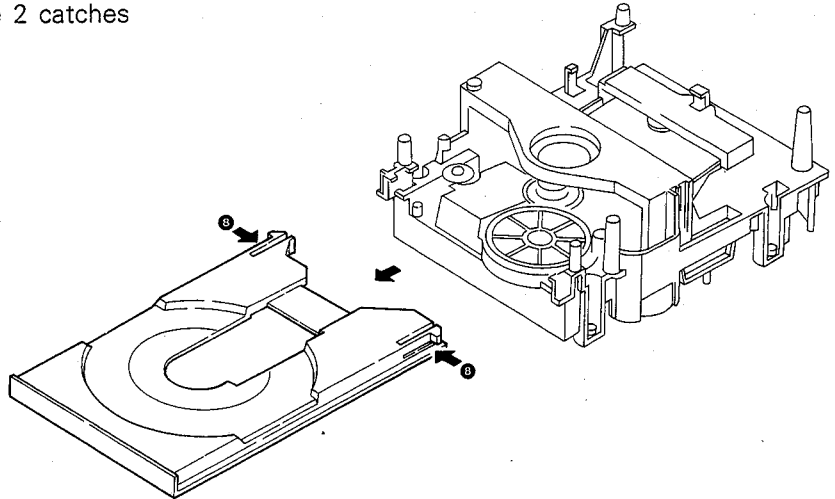
1. Disconnect the 4 connectors (6).
2. Remove the 4 screws (7), then remove the mechanism ass'y.



# DP-470

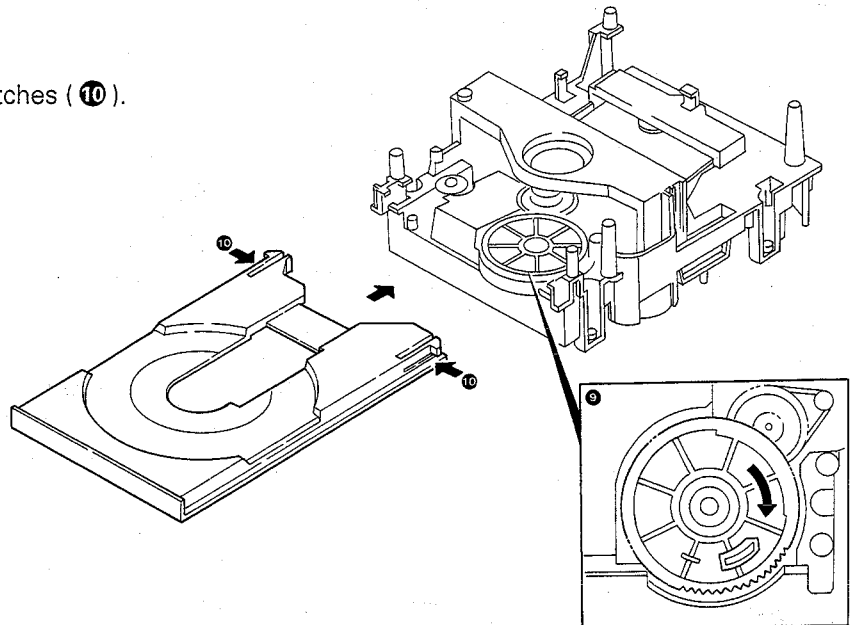
## DISASSEMBLY FOR REPAIR

- Slide the tray front-wards, remove the 2 catches (8), then remove the tray.



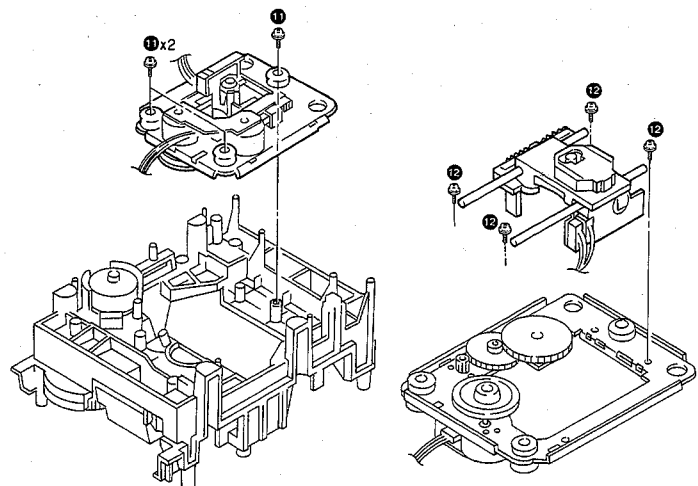
### 4. How to mount the tray

- Turn the gear fully clockwise (9).
- Insert the tray while pressing the 2 catches (10).

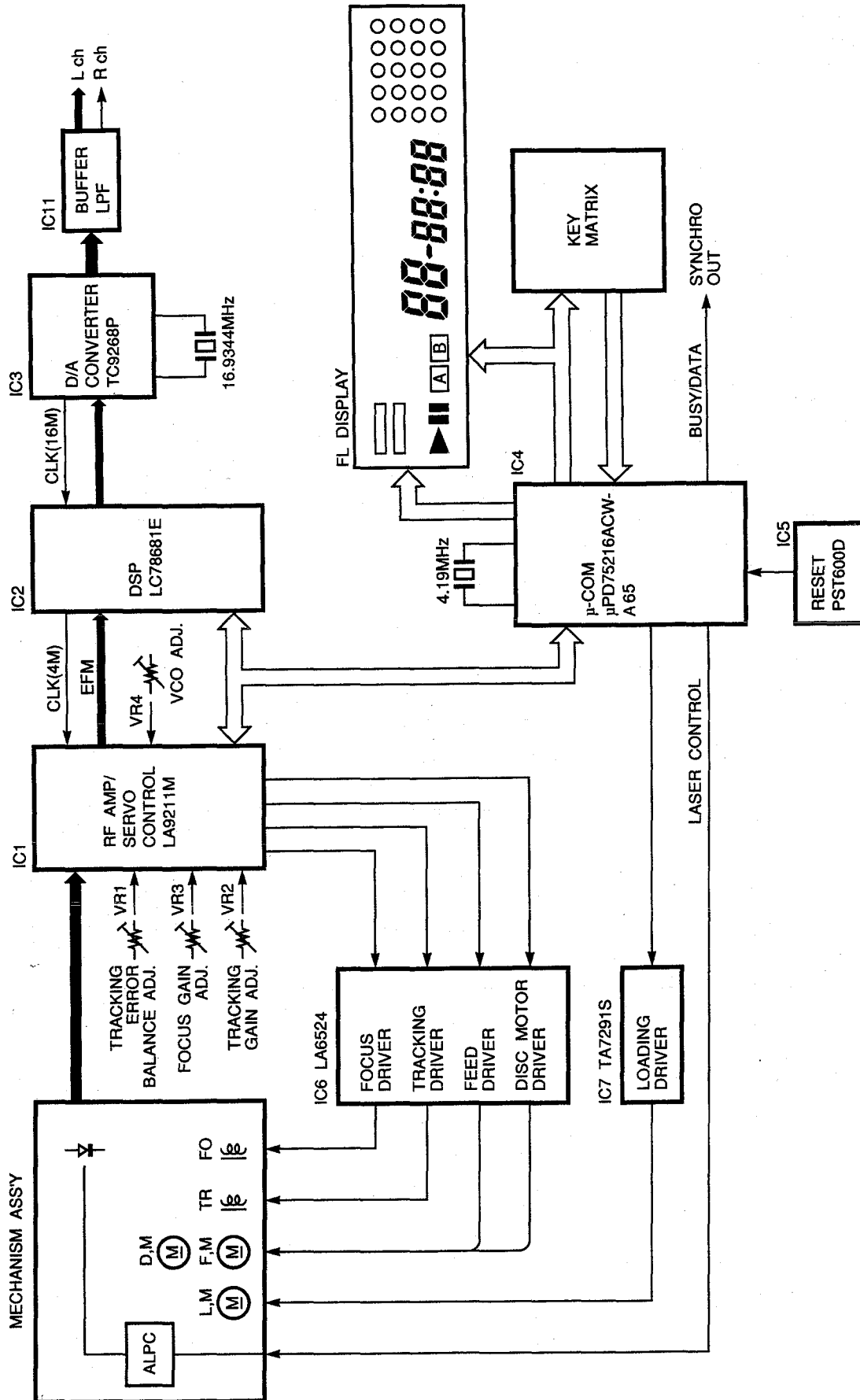


### 5. Removing the pickup

- Remove the 3 screws (11), then remove the pickup mechanism ass'y.
- Remove the 4 screws (12), then remove the pickup.



## BLOCK DIAGRAM

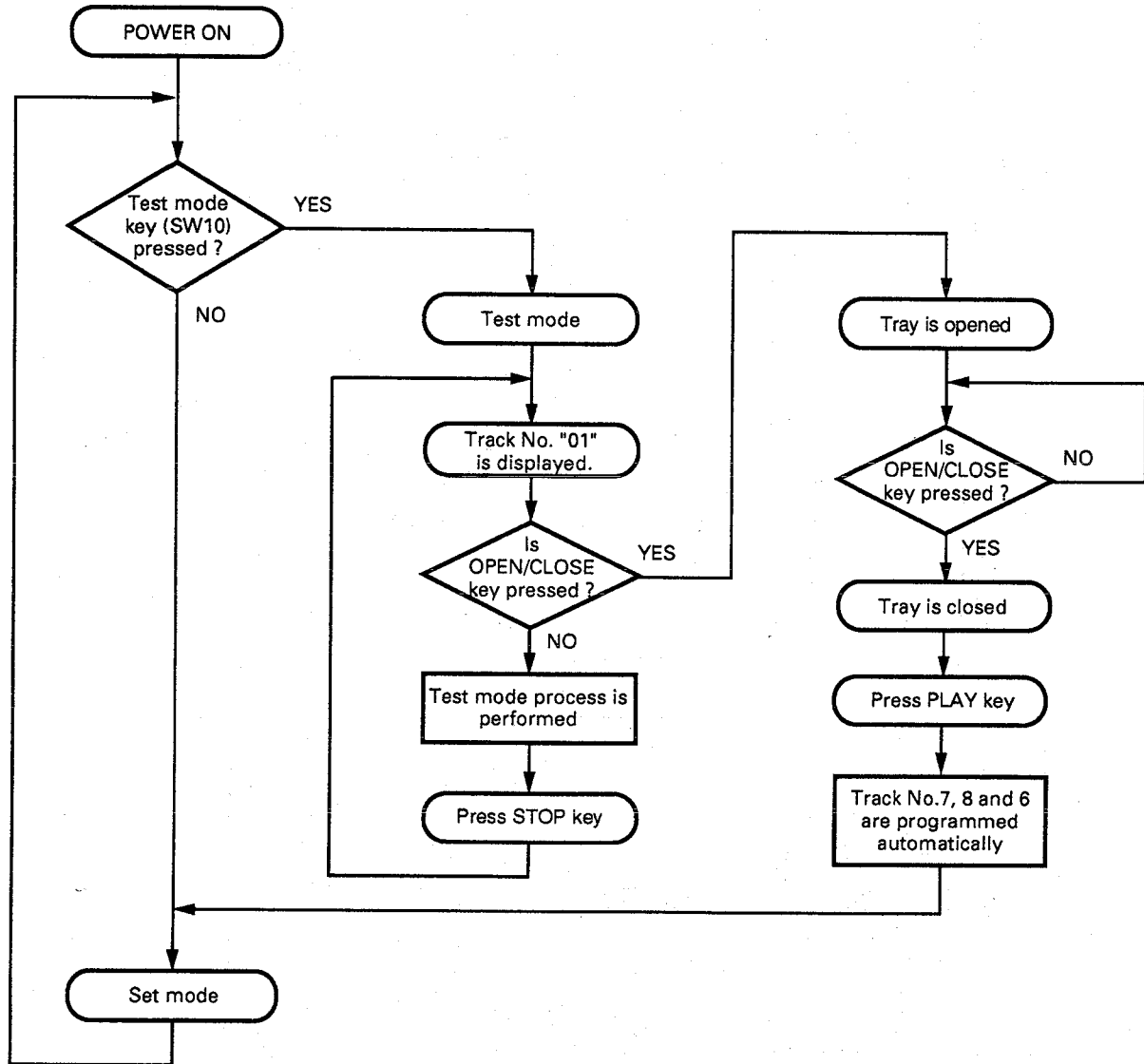


## CIRCUIT DESCRIPTION

### 1. Test mode

#### 1-1. Setting the test mode

This microprocessor built in this unit can be put to TEST MODE (SW10).





## CIRCUIT DESCRIPTION

### 1-2. Key and functions valid in test mode

| No.              | Input key                  | Function  | Track No. display   |     |      |   |   |   |                  |   |   |     |     |      |           |       |  |  |  |  |     |   |   |   |   |   |                  |   |   |     |     |           |       |  |  |  |  |   |
|------------------|----------------------------|---|---|-----|------|---|---|---|------------------|---|---|-----|-----|------|-----------|-------|--|--|--|--|-----|---|---|---|---|---|------------------|---|---|-----|-----|-----------|-------|--|--|--|--|---|
| 1                | PLAY                       | (1) Focusing servo ..... ON<br>(2) Tracking servo ..... ON<br>(3) Feed servo ..... ON   | TRACK NO.<br>05<br>↓<br>Displayed for a few seconds after completion (1), (2) and (3).<br>↓<br>Disc Track No. is displayed. |     |      |   |   |   |                  |   |   |     |     |      |           |       |  |  |  |  |     |   |   |   |   |   |                  |   |   |     |     |           |       |  |  |  |  |   |
| 2                | CHECK or<br>Number "0" key | (1) Focusing servo ..... ON<br>(2) Tracking servo ..... OFF<br>(3) Feed servo ..... OFF   | TRACK NO.<br>03   |     |      |   |   |   |                  |   |   |     |     |      |           |       |  |  |  |  |     |   |   |   |   |   |                  |   |   |     |     |           |       |  |  |  |  |   |
| 3                | STOP                       | (1) Focusing servo ..... OFF<br>(2) Tracking servo ..... OFF<br>(3) Feed servo ..... OFF  | TRACK NO.<br>01   |     |      |   |   |   |                  |   |   |     |     |      |           |       |  |  |  |  |     |   |   |   |   |   |                  |   |   |     |     |           |       |  |  |  |  |   |
| 4                | ▶▶                         | In the STOP mode, moves the pickup slightly toward the outer position of disc.<br>When feed servo is ON, sets the track gain to "H".  | -   |     |      |   |   |   |                  |   |   |     |     |      |           |       |  |  |  |  |     |   |   |   |   |   |                  |   |   |     |     |           |       |  |  |  |  |   |
| 5                | ◀◀                         | In the STOP mode, moves the pickup slightly toward the inner position of disc.<br>When feed servo is ON, sets the track gain to "L".  | -   |     |      |   |   |   |                  |   |   |     |     |      |           |       |  |  |  |  |     |   |   |   |   |   |                  |   |   |     |     |           |       |  |  |  |  |   |
| 6                | UP<br>▶▶                   | Turns all FL display lamps ON.  | TRACK NO.<br>88   |     |      |   |   |   |                  |   |   |     |     |      |           |       |  |  |  |  |     |   |   |   |   |   |                  |   |   |     |     |           |       |  |  |  |  |   |
| 7                | DOWN<br>◀◀                 | Turns all FL display lamps OFF. "TRACK NO." is lighted.   | TRACK NO.<br>88   |     |      |   |   |   |                  |   |   |     |     |      |           |       |  |  |  |  |     |   |   |   |   |   |                  |   |   |     |     |           |       |  |  |  |  |   |
| 8                | +10                        | Playback Track No.1 under High-speed mode (If not open tray, SPACE key function is available.)  | -   |     |      |   |   |   |                  |   |   |     |     |      |           |       |  |  |  |  |     |   |   |   |   |   |                  |   |   |     |     |           |       |  |  |  |  |   |
| 9                | SPACE                      | Set playback mode to High-speed or Normal.  | -   |     |      |   |   |   |                  |   |   |     |     |      |           |       |  |  |  |  |     |   |   |   |   |   |                  |   |   |     |     |           |       |  |  |  |  |   |
| 10               | P. MODE                    | Track No. 7,8, and 6 (High-speed) are programmed and playback from Track No.7. The test mode is canceled.   | -   |     |      |   |   |   |                  |   |   |     |     |      |           |       |  |  |  |  |     |   |   |   |   |   |                  |   |   |     |     |           |       |  |  |  |  |   |
| 11               | OPEN/CLOSE                 | When the tray is opened then closed. Track No. 7, 8, and 6 are programmed and set is in STOP mode.<br>The test mode is canceled.  | TRACK NO.<br>00   |     |      |   |   |   |                  |   |   |     |     |      |           |       |  |  |  |  |     |   |   |   |   |   |                  |   |   |     |     |           |       |  |  |  |  |   |
| 12               | Numeric key<br>(1 ~ 9)     | Jumps tracks as shown below.<br><table border="1" style="margin-left: 20px;"> <tbody> <tr> <td>Key</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> </tr> <tr> <td>Number of tracks</td> <td>1</td> <td>4</td> <td>128</td> <td>512</td> <td>1000</td> </tr> <tr> <td>Direction</td> <td colspan="5" style="text-align: center;">Outer</td> </tr> <tr> <td>Key</td> <td>6</td> <td>7</td> <td>8</td> <td>9</td> <td rowspan="2" style="text-align: center;">/</td> </tr> <tr> <td>Number of tracks</td> <td>1</td> <td>4</td> <td>128</td> <td>512</td> </tr> <tr> <td>Direction</td> <td colspan="5" style="text-align: center;">Inner</td> </tr> </tbody> </table> | Key   | 1   | 2    | 3 | 4 | 5 | Number of tracks | 1 | 4 | 128 | 512 | 1000 | Direction | Outer |  |  |  |  | Key | 6 | 7 | 8 | 9 | / | Number of tracks | 1 | 4 | 128 | 512 | Direction | Inner |  |  |  |  | - |
| Key              | 1                          | 2   | 3   | 4   | 5    |   |   |   |                  |   |   |     |     |      |           |       |  |  |  |  |     |   |   |   |   |   |                  |   |   |     |     |           |       |  |  |  |  |   |
| Number of tracks | 1                          | 4   | 128   | 512 | 1000 |   |   |   |                  |   |   |     |     |      |           |       |  |  |  |  |     |   |   |   |   |   |                  |   |   |     |     |           |       |  |  |  |  |   |
| Direction        | Outer                      |   |   |     |      |   |   |   |                  |   |   |     |     |      |           |       |  |  |  |  |     |   |   |   |   |   |                  |   |   |     |     |           |       |  |  |  |  |   |
| Key              | 6                          | 7   | 8   | 9   | /    |   |   |   |                  |   |   |     |     |      |           |       |  |  |  |  |     |   |   |   |   |   |                  |   |   |     |     |           |       |  |  |  |  |   |
| Number of tracks | 1                          | 4   | 128   | 512 |      |   |   |   |                  |   |   |     |     |      |           |       |  |  |  |  |     |   |   |   |   |   |                  |   |   |     |     |           |       |  |  |  |  |   |
| Direction        | Inner                      |   |   |     |      |   |   |   |                  |   |   |     |     |      |           |       |  |  |  |  |     |   |   |   |   |   |                  |   |   |     |     |           |       |  |  |  |  |   |
| 13               | REPEAT                     | (1) Tray ..... Opened<br>(2) Laser ..... ON<br>The REPEAT function is canceled when the tray is closed by pressing the tray.<br>"REPEAT" figures is lighted.  | TRACK NO.<br>02   |     |      |   |   |   |                  |   |   |     |     |      |           |       |  |  |  |  |     |   |   |   |   |   |                  |   |   |     |     |           |       |  |  |  |  |   |

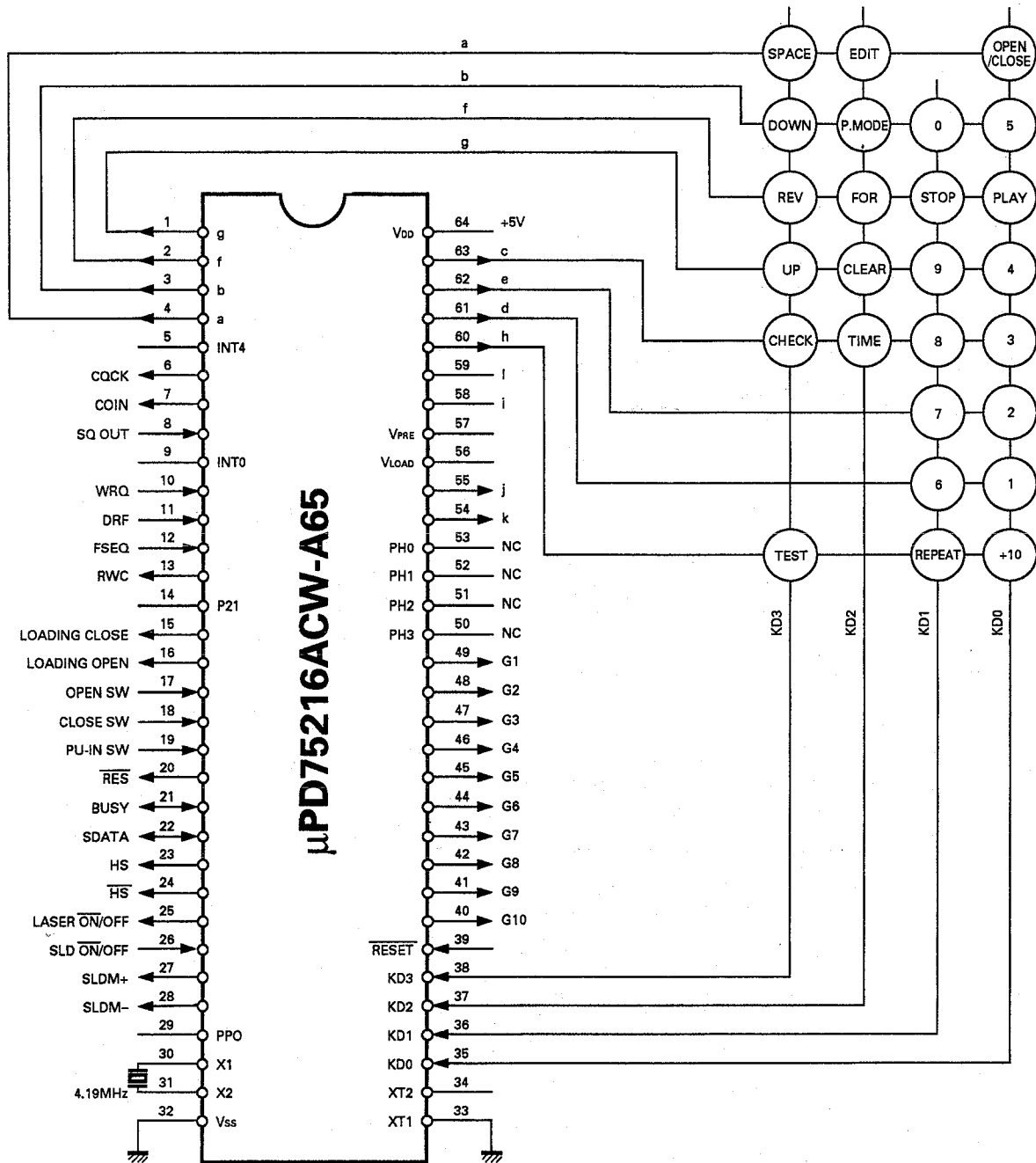
REPEAT mode : Press "REPEAT" key → Press "OPEN/CLOSE" key → Press "REPEAT" key...

# DP-470

## CIRCUIT DESCRIPTION

### 2. Microprocessor : $\mu$ PD75216ACW-A65 (IC4)

#### 2-1. Terminal connection diagram



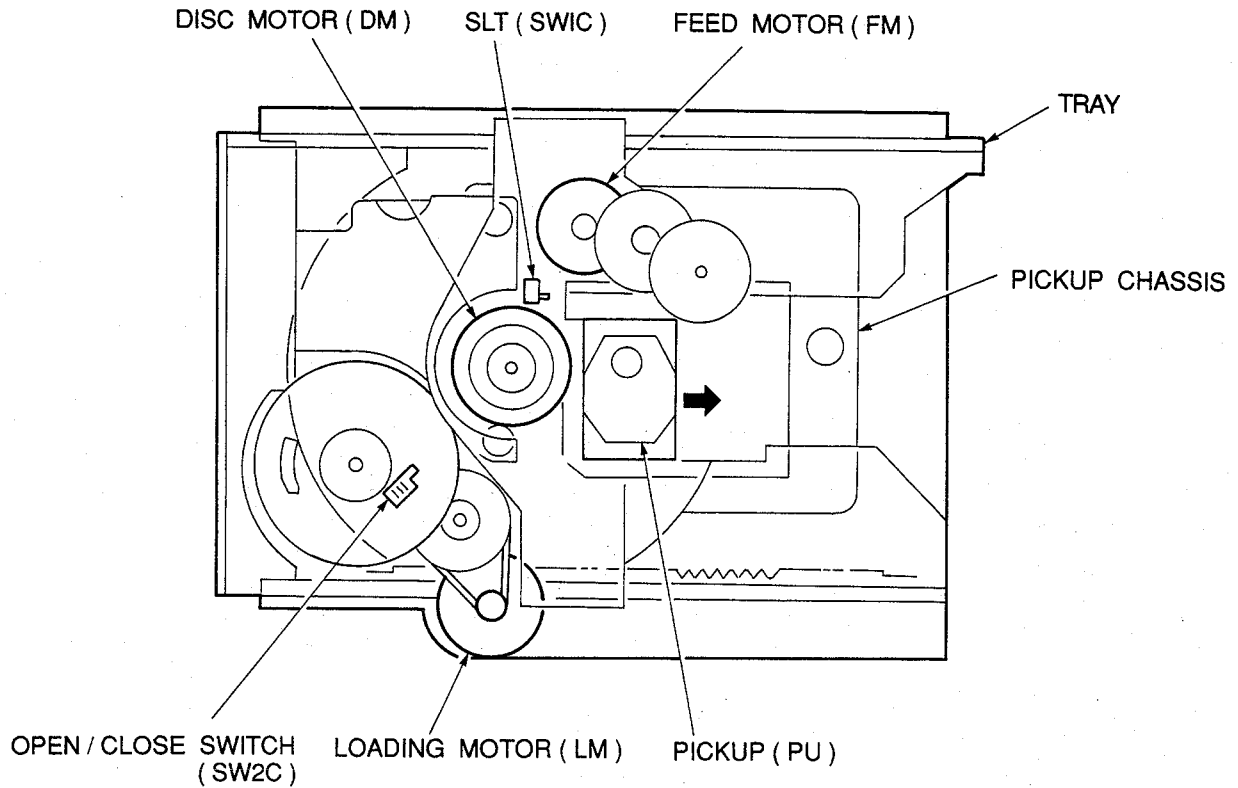
## CIRCUIT DESCRIPTION

## 2-2. Pin function

| No.    | Pin name         | I/O | Function                                       |
|--------|------------------|-----|--|
| 1~4    | g, f, b, a       | O   | Fluorescent indicator segment.                 |
| 5      | INT4             | -   | GND  |
| 6      | CQCK             | O   | DSP IC CQCK terminal.                          |
| 7      | COIN             | O   | DSP IC COIN terminal.                          |
| 8      | SQ OUT           | I   | DSP IC SQ OUT terminal.                        |
| 9      | INT0             | -   | GND  |
| 10     | WRQ              | I   | DSP IC WRQ terminal.                           |
| 11     | DRF              | I   | LA9211M DRF terminal.                          |
| 12     | FSEQ             | I   | DSP IC FSEQ terminal.                          |
| 13     | PWC              | O   | DSP IC RWC terminal.                           |
| 14     | P21              | -   | GND  |
| 15     | LOADING CLOSE    | O   | Tray close signal output.                      |
| 16     | LOADING OPEN     | O   | Tray open signal output.                       |
| 17     | OPEN SW          | I   | Tray open detection signal input.              |
| 18     | CLOSE SW         | I   | Tray close detection signal input.             |
| 19     | PU-IN SW         | I   | Pick up limit signal input.                    |
| 20     | RES              | O   | DSP IC reset signal output.                    |
| 21     | BUSY             | I/O | System control signal (BUSY).                  |
| 22     | SDATA            | I/O | System control signal (DATA).                  |
| 23     | HS               | O   | High speed control.                            |
| 24     | HS               | O   | High speed control.                            |
| 25     | LASER ON/OFF     | O   | Laser ON/OFF control signal output.            |
| 26     | SLD ON/OFF       | I   | Feed motor ON/OFF signal input.                |
| 27     | SLD +            | O   | Feed motor control signal output.              |
| 28     | SLD -            | O   | Feed motor control signal output.              |
| 29     | PPO              | -   | No connected.                                  |
| 30     | X1               | I   | Oscillator signal input.                       |
| 31     | X2               | O   | Oscillator signal output.                      |
| 32     | Vss              | -   | GND  |
| 33     | XT1              | -   | GND  |
| 34     | XT2              | -   | No connected.                                  |
| 35~38  | KD0~KD3          | I   | Key input signal.                              |
| 39     | RESET            | I   | Reset signal input.                            |
| 40~49  | G10~G1           | O   | Fluorescent indicator tube grid signal output. |
| 50~53  |                  | -   | GND  |
| 54, 55 | k, j             | O   | Fluorescent indicator segment.                 |
| 56     | VLOAD            | -   | FL pull down resistor power supply (-30V).     |
| 57     | VPRE             | -   | FL driver circuit power supply (-6V).          |
| 58~63  | i, l, h, d, e, c | O   | Fluorescent indicator segment.                 |
| 64     | VDD              | -   | Power supply (+5V).                            |

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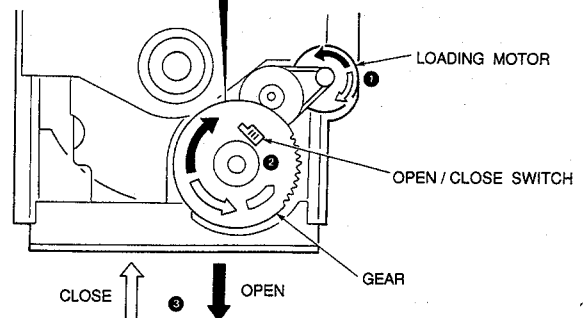
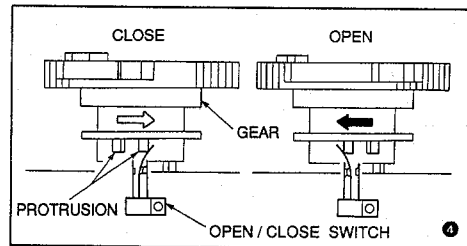
## MECHANISM OPERATION DESCRIPTION



### 1. Tray OPEN/CLOSE operation

By the rotation of the motor (①), the gear (②) is rotated and the tray starts OPEN/CLOSE operation (③).

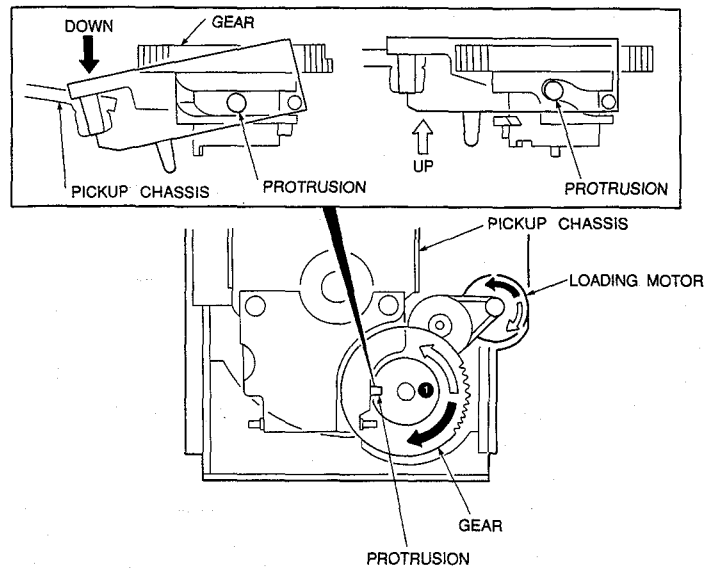
The OPEN/CLOSE operation stops when the protrusion of the gear comes in contact with the detection switch (④).



## MECHANISM OPERATION DESCRIPTION

### 2. Pickup chassis UP/DOWN operation

Accompanied with the OPEN/CLOSE operation, the pickup chassis moves up and down along with the grooves in the gear (1).



## ADJUSTMENT

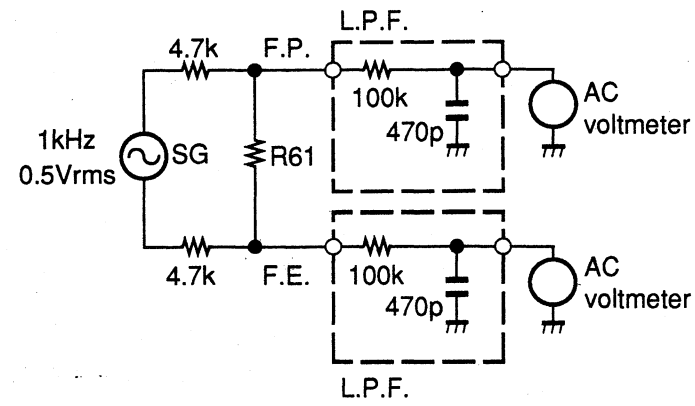
| No. | ITEM                    | INPUT SETTING  | OUTPUT SETTING   | PLAYER SETTING   | ALIGNMENT POINT | ALIGN FOR   | FIG. |
|-----|-------------------------|--|--|--|-----------------|---|------|
| 1   | VCO                     | Test disc<br>Type 4  | Connect the frequency counter to "VCO" and GND.                        | Short-circuit pins TEST and turn the power on to enter the test mode.<br>Press the STOP key.<br>Then, confirm that the display is "01" | VR4             | 4.24MHz±15kHz   | (a)  |
| 2   | TRACKING ERROR BALANCE  | Test disc<br>Type 4  | Connect the oscilloscope to "T.ER".                                    | Press the OPEN/CLOSE key to open the tray.<br>Reset to TEST mode<br>Then, press the CHECK key.<br>Confirm that the display is "03".    | VR1             | Symmetry between upper and lower patterns,<br>or DC=0±0.05V | (b)  |
| 3   | FOCUS GAIN              | Test disc<br>Type 4<br>Apply signal of 1kHz, 0.5Vrms to R61(F.P.- F.E.). | Connect a LPP to R61 (F.P.- F.E.), to which connect two AC voltmeters. | Press the PLAY key<br>Confirm that the display is "05".  | VR3             | Two VTVMs should read the same value.                       | (c)  |
| 4   | TRACKING GAIN           | Test disc<br>Type 4<br>Apply signal of 1kHz, 0.5Vrms to R63(T.P.- T.E.). | Connect a LPP to R63 (T.P.- T.E.), to which connect two AC voltmeters. | Press the PLAY key<br>Confirm that the display is "05".  | VR2             | Two VTVMs should read the same value.                       | (d)  |
| 5   | H.F. LEVEL CONFIRMATION | Test disc<br>Type 4  | Connect the oscilloscope to "H.F.".                                    | Press the PLAY key<br>Confirm that the display is "05".  | -               | 1.5Vp-p ~ 2.5Vp-p   | (e)  |

(NOTE) Type 4 disc : SONY YEDS-18 TEST DISC or equivalent.  
Adjustment procedures are in TEST MODE.

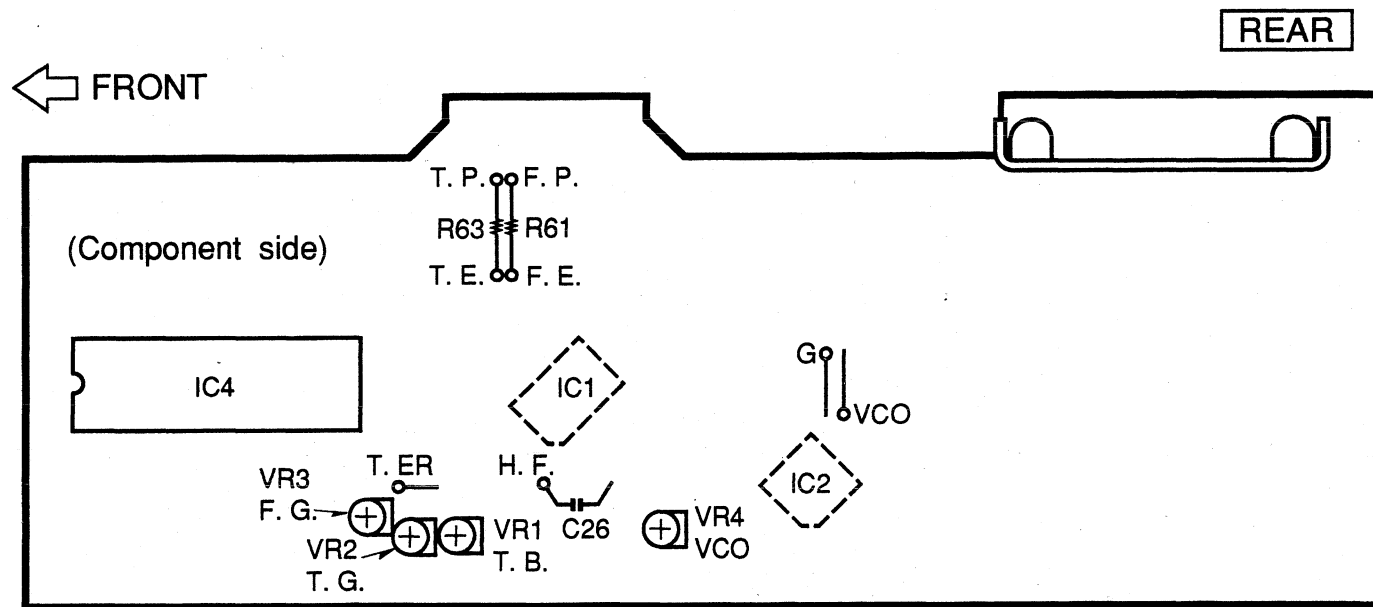
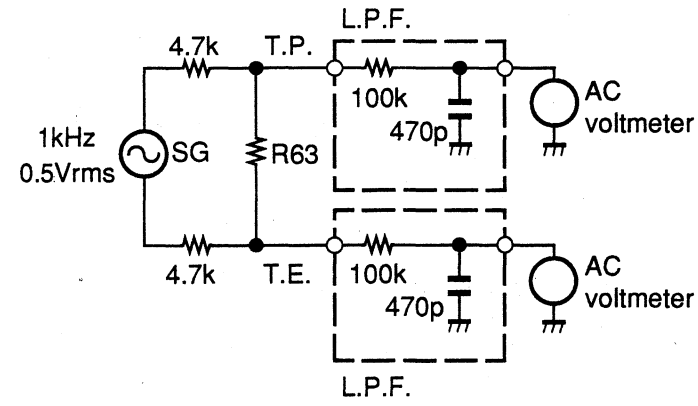
ADJUSTMENT

ADJUSTMENT

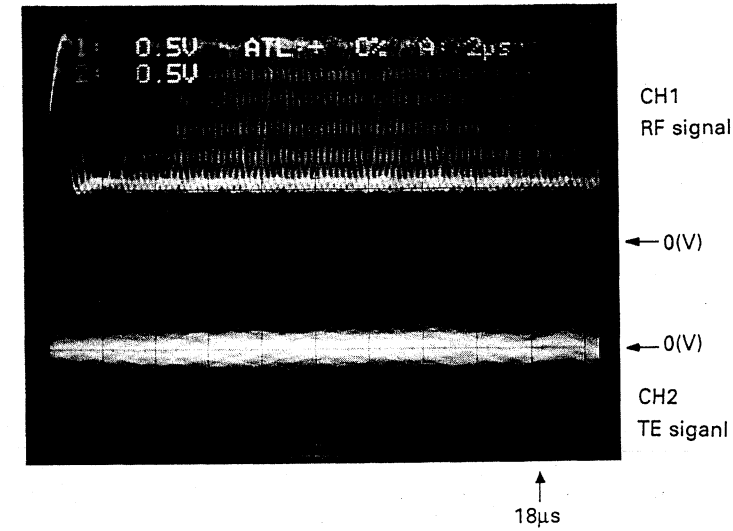
(c) Focus gain



(d) Tracking gain

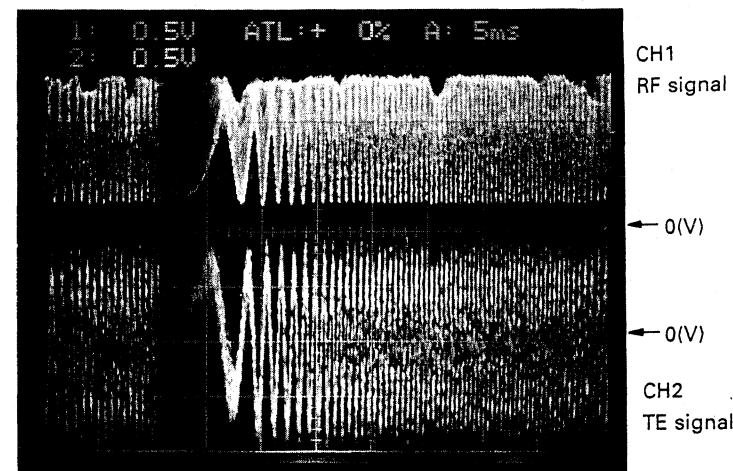


RF level, TE waveform



- RF signal and E.Spot signal in test mode (PLAY).
- If the diffraction grating has been adjusted properly, the influence of triggering is observed on the E.Spot waveform of approx. 18μs after RF signal, in the form of a projection.

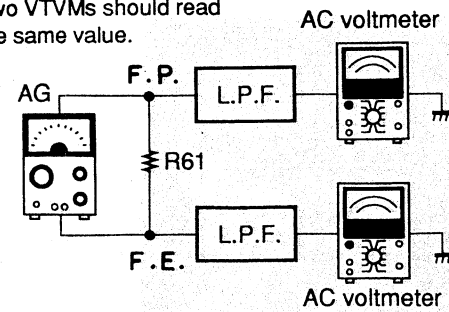
(b) Tracking error balance



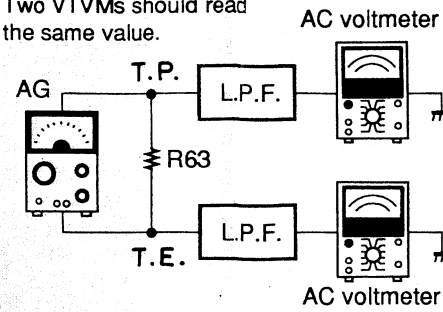
- RF signal and T.Error signal; in test mode (Focusing ON). (Disc type 4)
- Adjust T.Error so that the waveform is symmetrical above and below 0V. (VR 1)

# PC BOARD (COMPONENT SIDE VIEW)

(c) Focus gain :  
Two VTVMs should read  
the same value.

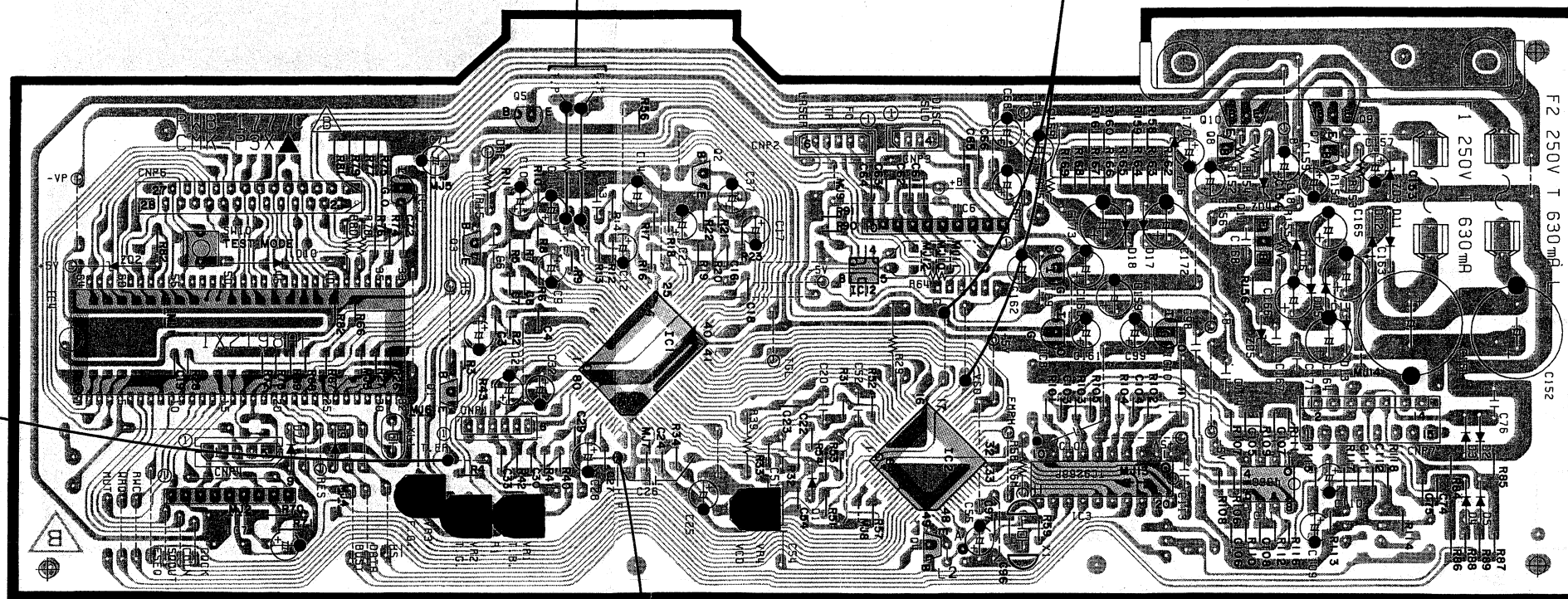
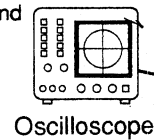


(d) Tracking gain :  
Two VTVMs should read  
the same value.

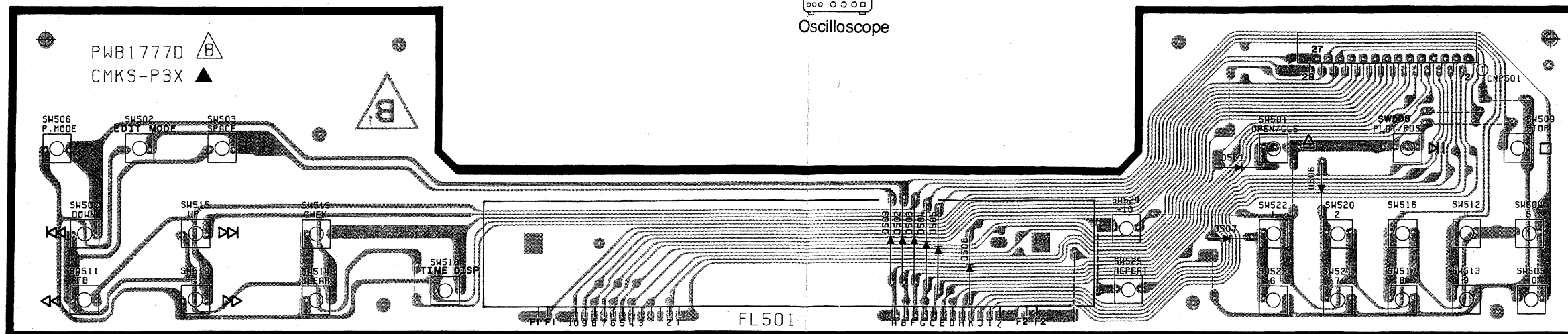
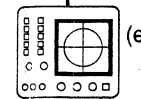


Frequency counter  
(a) VCO : 4.24MHz ± 15kHz

(b) Tracking error balance :  
Symmetry between upper and  
lower patterns,  
or  
DC=0 ± 0.05V



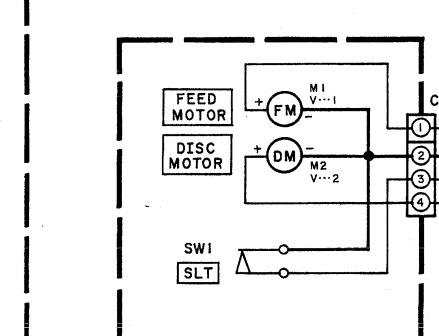
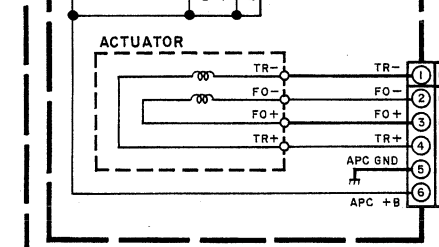
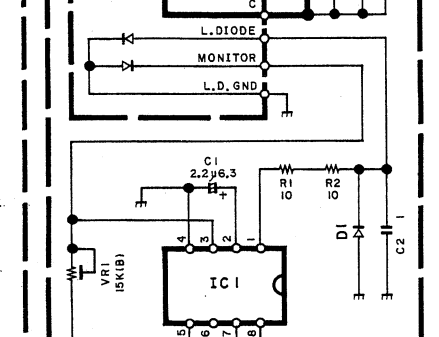
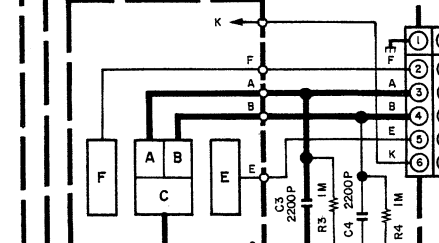
(e) H.F. Level confirmation :  
1.5Vp-p ~ 2.5Vp-p



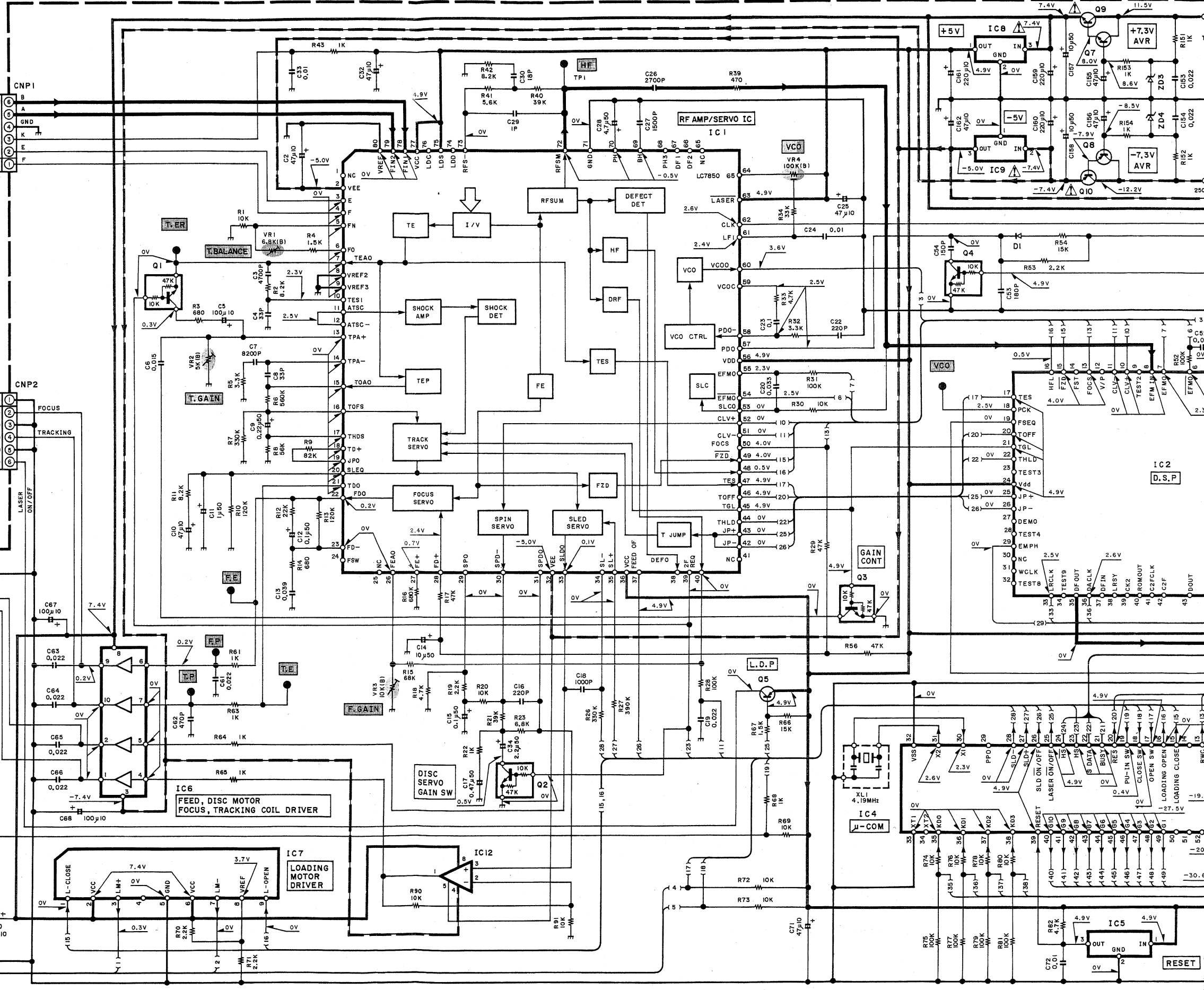


MECHANISM ASS'Y

HOLOGRAM LASER UNIT (PICK UP)

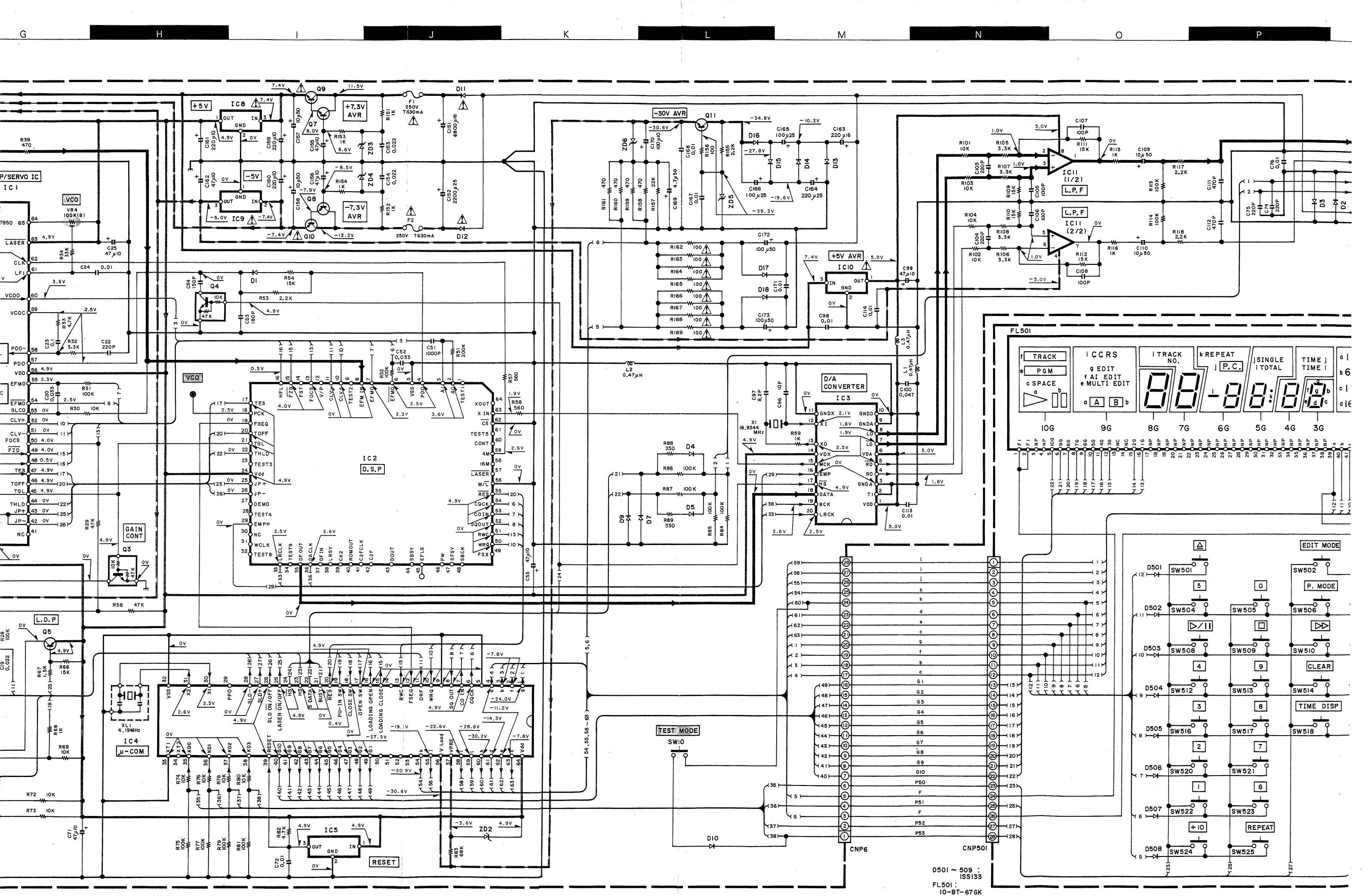


MAIN UNIT

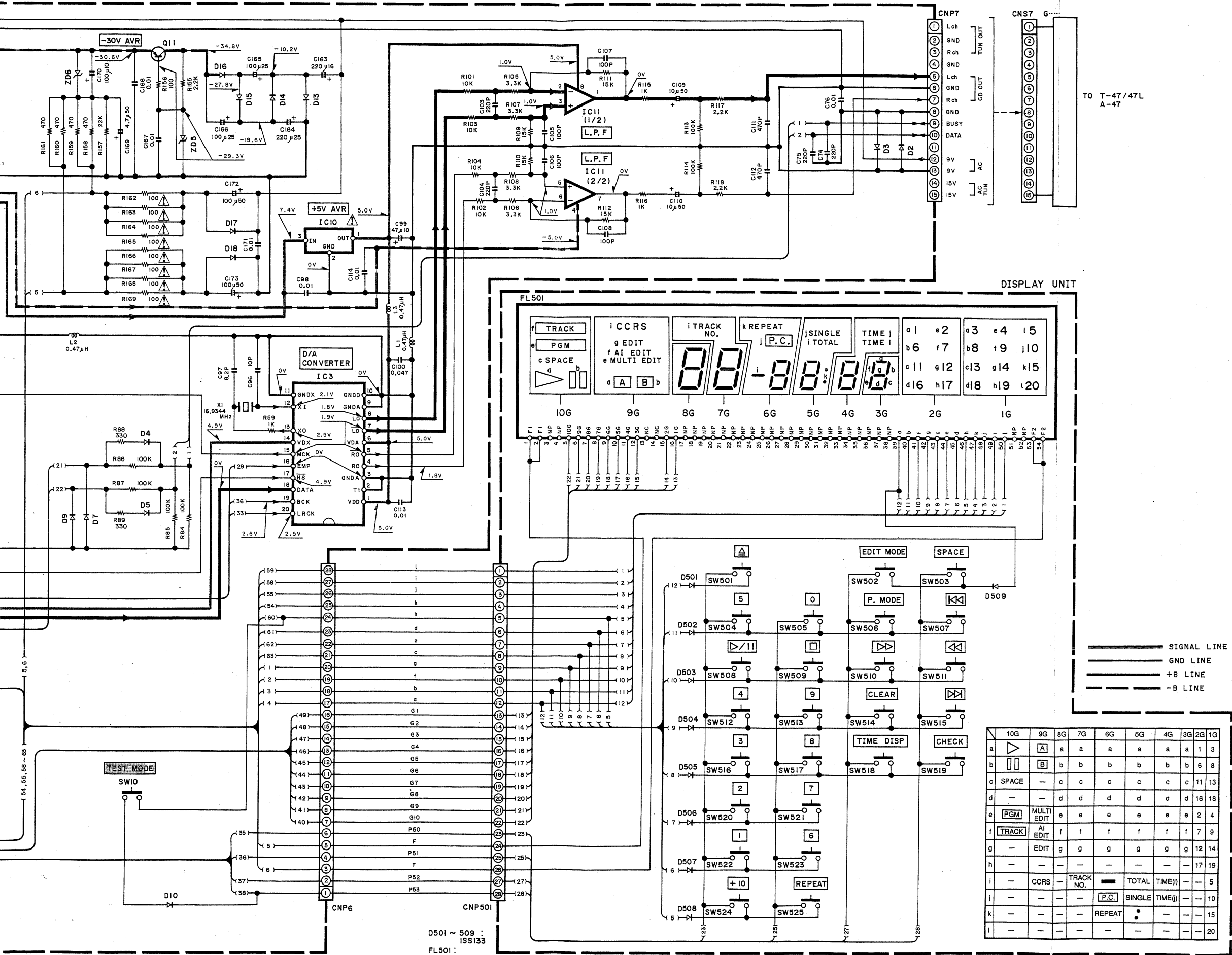


- |                       |                   |
|-----------------------|-------------------|
| IC1 : LA9211M         | Q1-4 : DTC114YS   |
| IC2 : LC78681E        | Q5 : 2SA1015GR    |
| IC3 : TC9268P         | Q7 : 2SC1740SR    |
| IC4 : μPD75216ACW-W65 | Q8 : 2SA933SR     |
| IC5 : PST600D         | Q9 : 2SD2012      |
| IC6 : LA6524          | Q10 : 2SB1375     |
| IC7 : TA7291S         | Q11 : 2SB1237R3   |
| IC8 : TA78L005AP      |                   |
| IC9 : AN79L05         | D1-5,7,9,10,13-18 |
| IC10 : AN78L05        | : 1SS133          |
| IC11 : NUM4560D       | D11,12 : RL104T   |
| IC12 : NJM4558M       | ZD2-4 : MTZ9.1A   |
|                       | ZD5 : MTZJ30B     |
|                       | ZD6 : MTZJ6.8B    |

2  
3  
4  
5  
6  
7

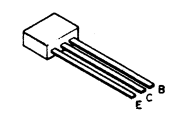


D501 ~ 509 : ISS133  
 FL501 : 10-BT-676K

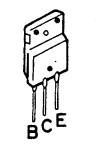


TO T-47/47L  
A-47

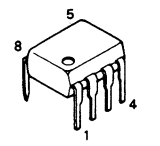
DTC114YS



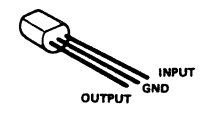
2SB1375  
2SD2012



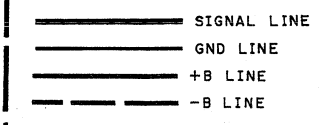
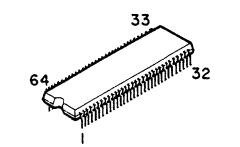
NJM4560D



TA78L005AP



UPD75216ACW-A65



|   | 10G   | 9G         | 8G | 7G        | 6G | 5G            | 4G | 3G | 2G | 1G    |
|---|-------|------------|----|-----------|----|---------------|----|----|----|-------|
| a | ▶     | A          | a  | a         | a  | a             | a  | a  | a  | 1 3   |
| b | ▭     | B          | b  | b         | b  | b             | b  | b  | b  | 6 8   |
| c | SPACE | -          | c  | c         | c  | c             | c  | c  | c  | 11 13 |
| d | -     | -          | d  | d         | d  | d             | d  | d  | d  | 16 18 |
| e | PGM   | MULTI EDIT | e  | e         | e  | e             | e  | e  | e  | 2 4   |
| f | TRACK | AI EDIT    | f  | f         | f  | f             | f  | f  | f  | 7 9   |
| g | -     | EDIT       | g  | g         | g  | g             | g  | g  | g  | 12 14 |
| h | -     | -          | -  | -         | -  | -             | -  | -  | -  | 17 19 |
| i | -     | CCRS       | -  | TRACK NO. | -  | TOTAL TIME()  | -  | -  | -  | 5     |
| j | -     | -          | -  | [P.C.]    | -  | SINGLE TIME() | -  | -  | -  | 10    |
| k | -     | -          | -  | REPEAT    | -  | •             | -  | -  | -  | 15    |
| l | -     | -          | -  | -         | -  | -             | -  | -  | -  | 20    |

D501 ~ 509 :  
ISS133  
FL501 :  
10-BT-67GK

DP-470 (K)

• DC voltages are as measured with a high impedance voltmeter. Values may vary slightly due to variations between individual instruments or/and units.

**CAUTION:** For continued safety, replace safety critical components only with manufacturer's recommended parts (refer to parts list). Δ Indicates safety critical components. To reduce the risk of electric shock, leakage-current or resistance measurements shall be carried out (exposed parts are acceptably insulated from the supply circuit) before the appliance is returned to the customer.

**DP-470**  
**KENWOOD**

Y22-3492-70





\* New Parts  
Parts without Parts No. are not supplied.  
Les articles non mentionnés dans le Parts No. ne sont pas fournis.  
Teile ohne Parts No. werden nicht geliefert.

3

| Ref. No.<br>参照番号      | Address<br>位置 | Parts No.<br>部品番号 | Description<br>部品名/規格          | Desti-<br>nation<br>仕 | Re-<br>marks<br>備考 |
|-----------------------|---------------|-------------------|--------------------------------|-----------------------|--------------------|
| Δ F1 ,2               |               | F05-6313-05       | FUSE(250V T630mA)              |                       |                    |
| X1                    | *             | L77-2132-08       | CRYSTAL REZONATOR(16.9344MHz)  |                       |                    |
| XL1                   |               | L78-0267-05       | REZONATOR(4.19MHz)             |                       |                    |
| VR1                   | *             | R12-2048-08       | TRIMMING POT. 6.8KΩ T. BALANCE |                       |                    |
| VR2                   |               | R12-1619-05       | TRIMMING POT. 4.7KΩ T. GAIN    |                       |                    |
| VR3                   |               | R12-3685-05       | TRIMMING POT. 10KΩ T. GAIN     |                       |                    |
| VR4                   |               | R12-5651-05       | TRIMMING POT. 100KΩ VCO        |                       |                    |
| SH10                  |               | SH1305301218      | TACT SWITCH( TEST MODE)        |                       |                    |
| SW501-525             |               | SH1305301218      | TACT SWITCH(EJECT etc.)        |                       |                    |
| D1 -5                 |               | 1SS133            | DIODE                          |                       |                    |
| D7                    |               | 1SS133            | DIODE                          |                       |                    |
| D9 ,10                |               | 1SS133            | DIODE                          |                       |                    |
| D11 ,12               |               | RL104T            | DIODE                          |                       |                    |
| Δ D13 -18             |               | 1SS133            | DIODE                          |                       |                    |
| D501-509              |               | 1SS133            | DIODE                          |                       |                    |
| FL501                 |               | 10-BT-676K        | INDICATOR TUBE                 |                       |                    |
| IC1                   |               | LA9211M           | IC(RF AMP/SERV0)               |                       |                    |
| IC2                   | *             | LC78681E          | IC(D. S.P.)                    |                       |                    |
| IC3                   | *             | TC9268P           | IC(O/A CONVERTOR)              |                       |                    |
| IC4                   | *             | UPD75216ACW-A65   | IC(MICROPROCESSOR)             |                       |                    |
| IC5                   | *             | PST6000           | IC(RESET)                      |                       |                    |
| IC6                   | *             | LA6524            | IC(DRIVER)                     |                       |                    |
| IC7                   |               | TA7291S           | IC(BRIDGE DRIVER)              |                       |                    |
| Δ IC8                 |               | TA78L005AP        | IC(VOLTAGE REGULATOR/ +5V)     |                       |                    |
| Δ IC9                 | *             | AN79L05T          | IC(VOLTAGE REGULATOR/ -5V)     |                       |                    |
| Δ IC10                | *             | AN78L05T          | IC(VOLTAGE REGULATOR/ +5V)     |                       |                    |
| IC11                  |               | NJM4560D          | IC(OP AMP X2)                  |                       |                    |
| Q1 -4                 |               | DTC144YS          | DIGITAL TRANSISTOR             |                       |                    |
| Q5                    |               | ZSA1015GR         | TRANSISTOR                     |                       |                    |
| Q7                    |               | ZSC1740SR         | TRANSISTOR                     |                       |                    |
| Q8                    |               | ZSA933SR          | TRANSISTOR                     |                       |                    |
| Q9                    |               | ZSD2012           | TRANSISTOR                     |                       |                    |
| Q10                   |               | ZSB1375           | TRANSISTOR                     |                       |                    |
| Q11                   |               | ZSB1237R3         | TRANSISTOR                     |                       |                    |
| ZD2 -4                |               | MTZ9.1A           | ZENER DIODE                    |                       |                    |
| ZD5                   |               | MTZJ30BT          | ZENER DIODE                    |                       |                    |
| ZD6                   |               | MTZJ6.8B          | ZENER DIODE                    |                       |                    |
| <b>MECHANISM ASSY</b> |               |                   |                                |                       |                    |
| 2                     | 1B            | SH1313730001      | MAGNET                         |                       |                    |
| 3                     | 1B            | T50-1067-08       | BRACKET MAGNET                 |                       |                    |
| 5                     | 1B            | D16-0362-08       | BELT DRIVE                     |                       |                    |
| 6                     | 1B            | D15-0364-08       | PULLEY DRIVE                   |                       |                    |
| 7                     | 1B            | SH1102810098      | GEAR PINION                    |                       |                    |
| 9                     | 1A            | SH1102480607      | SHIFT LEVER                    |                       |                    |
| 10                    | 1B            | A11-1021-08       | CHASSIS LOADING                |                       |                    |
| 11                    | 2B            | SH1302810228      | GEAR(MIDDLE)                   |                       |                    |
| 12                    | 2B            | SH1302810229      | GEAR(DRIVE)                    |                       |                    |
| 15                    | 3B            | SH1303260448      | CUSHION                        |                       |                    |
| 16                    | 2B            | SH1305301248      | PUSH SWITCH(SLT)               |                       |                    |
| 19                    | 3A            | SH1302810229      | GEAR(RACK MOVE)                |                       |                    |
| 20                    | 3A            | SH1252560244      | SPRING(RACK)                   |                       |                    |

L:Scandinavia  
Y:PX(Far East, Hawaii)  
Y:AAFES(Europe)

K:USA  
T:England  
X:Australia

P:Canada  
E:Europe  
M:Other Areas

Δ indicates safety critical components.

\* New Parts  
Parts without Parts No. are not supplied.  
Les articles non mentionnés dans le Parts No. ne sont pas fournis.  
Teile ohne Parts No. werden nicht geliefert.

4

PARTS LIST

| Ref. No.<br>参照番号 | Address<br>位置 | Parts No.<br>部品番号 | Description<br>部品名/規格 | Desti-<br>nation<br>仕 | Re-<br>marks<br>備考 |
|------------------|---------------|-------------------|-----------------------|-----------------------|--------------------|
| 21               | 3A            | SH1302810231      | GEAR(RACK FIX)        |                       |                    |
| 22               | 3B            | SH1302900394      | SHAFT(CUIDE)          |                       |                    |
| 23               | 2A            | SH1102140395      | DISC TRAY             |                       |                    |
| 24               | 2B            | S74-0027-08       | SWITCH(OPEN/CLOSE)    |                       |                    |
| A                |               | SH1109700853      | SCREW                 |                       |                    |
| B                |               | SH1319700021      | SCREW                 |                       |                    |
| C                |               | SH1309701730      | SCREW                 |                       |                    |
| D                |               | SH1309701711      | SCREW                 |                       |                    |
| E                |               | SH1169700032      | SCREW                 |                       |                    |
| F                |               | SH1309701535      | SCREW                 |                       |                    |
| DM               | 3B            | T42-0658-08       | DISC MOTOR ASSY       |                       |                    |
| FM               | 3B            | T42-0657-08       | SLIDE MOTOR WITH GEAR |                       |                    |
| LM               | 2B            | SH1106300200      | MOTOR WITH PULLEY     |                       |                    |
| PU               | 3A            | T25-0032-08       | PICKUP                |                       |                    |

L:Scandinavia  
Y:PX(Far East, Hawaii)  
Y:AAFES(Europe)

K:USA  
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E:Europe  
M:Other Areas

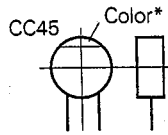
Δ indicates safety critical components.

## PARTS LIST

### CAPACITORS

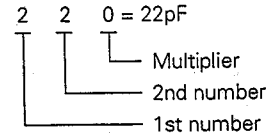
CC 45 TH 1H 220 J  
 1 2 3 4 5 6

- 1 = Type ... ceramic, electrolytic, etc.
- 2 = Shape ... round, square, ect.
- 3 = Temp. coefficient
- 4 = Voltage rating
- 5 = Value
- 6 = Tolerance



#### Capacitor value

- 010 = 1pF
- 100 = 10pF
- 101 = 100pF
- 102 = 1000pF = 0.001μF
- 103 = 0.01μF



#### Temperature coefficient

| 1st Word | C     | L   | P      | R      | S     | T    | U      |
|----------|-------|-----|--------|--------|-------|------|--------|
| Color*   | Black | Red | Orange | Yellow | Green | Blue | Violet |
| ppm/°C   | 0     | -80 | -150   | -220   | -330  | -470 | -750   |

| 2nd Word | G   | H   | J    | K    | L    |
|----------|-----|-----|------|------|------|
| ppm/°C   | ±30 | ±60 | ±120 | ±250 | ±500 |

Example : CC45TH = -470 ± 60ppm/°C

#### Tolerance (More than 10pF)

| Code | C     | D    | G  | J  | K   | M   | X          | Z          | P          | No code   |
|------|-------|------|----|----|-----|-----|------------|------------|------------|---|
| (%)  | ±0.25 | ±0.5 | ±2 | ±5 | ±10 | ±20 | +40<br>-20 | +80<br>-20 | +100<br>-0 | More than 10μF -10 ~ +50<br>Less than 4.7μF -10 ~ +75 |

#### (Less than 10pF)

| Code | B    | C     | D    | F  | G  |
|------|------|-------|------|----|----|
| (pF) | ±0.1 | ±0.25 | ±0.5 | ±1 | ±2 |

#### Voltage rating

| 2nd word | A    | B    | C    | D    | E    | F    | G    | H    | J    | K    | V   |   |
|----------|------|------|------|------|------|------|------|------|------|------|-----|---|
| 1st word | 0    | 1.0  | 1.25 | 1.6  | 2.0  | 2.5  | 3.15 | 4.0  | 5.0  | 6.3  | 8.0 | - |
| 1        | 10   | 12.5 | 16   | 20   | 25   | 31.5 | 40   | 50   | 63   | 80   | 35  |   |
| 2        | 100  | 125  | 160  | 200  | 250  | 315  | 400  | 500  | 630  | 800  | -   |   |
| 3        | 1000 | 1250 | 1600 | 2000 | 2500 | 3150 | 4000 | 5000 | 6300 | 8000 | -   |   |

#### Chip capacitors

(EX) C C 7 3 F S L 1 H 0 0 0 J  
 1 2 3 4 5 6 7

(Chip) (CH, RH, UJ, SL)

(EX) C K 7 3 F F 1 H 0 0 0 Z  
 1 2 3 4 5 6 7

(Chip) (B, F)

Refer to the table above.

- 1 = Type
- 2 = Shape
- 3 = Dimension
- 4 = Temp. coefficient
- 5 = Voltage rating
- 6 = Value
- 7 = Tolerance

#### Dimension (Chip capacitors)

| Dimension code | L         | W          | T              |
|----------------|-----------|------------|----------------|
| Empty          | 5.6 ± 0.5 | 5.0 ± 0.5  | Less than 2.0  |
| A              | 4.5 ± 0.5 | 3.2 ± 0.4  | Less than 2.0  |
| B              | 4.5 ± 0.5 | 2.0 ± 0.3  | Less than 2.0  |
| C              | 4.5 ± 0.5 | 1.25 ± 0.2 | Less than 1.25 |
| D              | 3.2 ± 0.4 | 2.5 ± 0.3  | Less than 1.5  |
| E              | 3.2 ± 0.2 | 1.6 ± 0.2  | Less than 1.25 |
| F              | 2.0 ± 0.3 | 1.25 ± 0.2 | Less than 1.25 |
| G              | 1.6 ± 0.2 | 0.8 ± 0.2  | Less than 1.0  |

### RESISTORS

#### Chip resistor (Carbon)

(EX) R K 7 3 E B 2 B 0 0 0 J  
 1 2 3 4 5 6 7

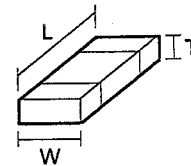
(Chip) (B, F)

#### Carbon resistor (Normal type)

(EX) R D 1 4 B B 2 C 0 0 0 J  
 1 2 3 4 5 6 7

- 1 = Type
- 2 = Shape
- 3 = Dimension
- 4 = Temp. coefficient
- 5 = Rating wattage
- 6 = Value
- 7 = Tolerance

#### Dimension



#### Dimension (Chip resistor)

| Dimension code | L         | W          | T         |
|----------------|-----------|------------|-----------|
| E              | 3.2 ± 0.2 | 1.6 ± 0.2  | 1.0       |
| F              | 2.0 ± 0.3 | 1.25 ± 0.2 | 1.0       |
| G              | 1.6 ± 0.2 | 0.8 ± 0.2  | 0.5 ± 0.1 |

#### Rating wattage

| Code | Wattage | Code | Wattage | Code | Wattage |
|------|---------|------|---------|------|---------|
| 1J   | 1/16W   | 2C   | 1/6W    | 3A   | 1W      |
| 2A   | 1/10W   | 2E   | 1/4W    | 3D   | 2W      |
| 2B   | 1/8W    | 2H   | 1/2W    |      |         |

# DP-470

## SPECIFICATIONS

### Format

**System** ..... Compact disc digital audio system  
**Laser** ..... Semiconductor laser  
**Number of channels** ..... 2 channels  
**Playing rotation** ..... 200rpm~500rpm (CLV)

### D/A convertors

**D/A conversion** ..... 1Bit  
**Oversampling** ..... 8fs (352.8kHz)

### Audio

**Frequency response** ..... 8Hz~20kHz,  $\pm 1.0$ dB  
**Signal to noise ratio** ..... More than 94dB

**Dynamic range** ..... More than 92dB  
**Total harmonic distortion** ..... Less than 0.005%  
**Channel separation** ..... More than 83dB  
**Wow & flutter** ..... Unmeasurable limit  
**Output level/impedance**  
**Fixed** ..... 1.2V/3.3k $\Omega$

### General

**Dimensions** ..... W : 360mm  
H : 94mm  
D : 307mm  
**Weight (Net)** ..... 3.4kg

---

**Note** : KENWOOD follows a policy of continuous advancements in development. For this reason specifications may be changed without notice.

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### Note :

Component and circuitry are subject to modification to insure best operation under differing local conditions. This manual is based on, the Europe (E) standard, and provides information on regional circuit modification through use of alternate schematic diagrams, and information on regional component variations through use of parts list.

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